

been amended to include the elements of claim 26. Accordingly, claim 25 should be in a condition for allowance.

The remainder of the pending claims (i.e. 52-79) mirror the claims in EP 0971540 B1 granted on June 26, 2002, however, the claims have eliminated any multiple dependency between the claims. The present application and EP 0971540 B1 both claim priority to the same US application, namely, application no. 07/699,366 filed on 5/13/91 (now Patent No. 5,185,667). While the grant of a corresponding European Patent is not binding on the US Patent and Trademark Office, the Applicants submit that this recent grant from the EPO for virtually identical claims is highly persuasive evidence that claims 52-79 are allowable in their present form.

The rejections under 35 USC §102 and §103 in the Office Action based on Weiman are now moot, as those claims have all been cancelled. While Applicants have cancelled such claims, the cancellation is not and should not be considered an acquiescence by Applicants of the merits of the rejections. Indeed, numerous elements of the cancelled claims did not have corresponding structure or steps in Weiman, nor was a prima facie case of obvious established pursuant to MPEP § 2142. Applicants have simply substituted the granted claims in the related EP Patent into the present applicant to expedite allowance and to obtain parallel patent protection in the United States. Accordingly, Applicants reserve all rights to with respect to the cancelled claims.

Based on the foregoing, all pending claims are in a condition for allowance. All pending claims overcome the rejections presented in the Office Action, and Applicants respectfully request reconsideration and an early notice of allowance.

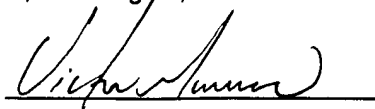
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Marked-Up Version of Claims

Please cancel claims 1-24, without prejudice.

Please amend claim 25 as follows:

25. (Three Times Amended) A memory for a signal processor, comprising:
 a data structure, responsive to a control input representing a selection of a portion of an, image stored in said memory, wherein said selection is chosen across a field of view, said data structure representing an orthogonal set of transformation algorithms; and
 a buffer memory adapted to store digital image data for transformation;
wherein said data structure transforms data according to the following equations:

$$X = \frac{R[uA - vB + mR\sin\beta\sin\partial]}{\sqrt{(u^2 + v^2 + m^2R^2)}}$$

$$Y = \frac{R[uC - vD - mR\sin\beta\cos\partial]}{\sqrt{(u^2 + v^2 + m^2R^2)}}$$

where:

$$A = (\cos\theta\cos\partial - \sin\theta\sin\partial\cos\beta)$$

$$B = (\sin\theta\cos\partial + \cos\theta\sin\partial\cos\beta)$$

$$C = (\cos\theta\sin\partial + \sin\theta\cos\partial\cos\beta)$$

$$D = (\sin\theta\sin\partial - \cos\theta\cos\partial\cos\beta)$$

and where:

R = radius of the image circle

β = zenith angle

∂ = Azimuth angle in image plane

θ = object plane rotation angle

m = Magnification

u,v = object plane coordinates

x,y = image plane coordinates.

Please cancel claims 26-31 and 38-51, without prejudice.

Please add claims 52-79 as follows:

52. (New) A system for providing perspective corrected views of a selected portion of a received optical image captured using a wide angle lens, the received optical image being distorted, the system comprising:

image capture means for receiving signals corresponding to said received optical image and for digitising said signal;

input image memory means for receiving said digitised signal;

input means for selecting a portion of said received image to view;

image transform processor means for processing said digitised signals to produce an output signal corresponding to a perspective corrected image of said selected portion of said received image;

output image memory means for receiving said output signal from said image transform processor means; and

output means connected to said output image memory means for recording or displaying said perspective corrected image of said selected portion;

characterised in that said image transform processor means comprises transform parameter calculation means for calculating transform parameters for said selected portion of said image and processes said digitised signal based on said calculated transform parameters to generate said output signal.

53. (New) A system according to claim 52, comprising a camera imaging system for receiving said optical image and for producing said signals corresponding to said received optical image for output to said image capture means.

54. (New) A system according to claim 53, comprising wide angle lens means mounted on said camera imaging system for producing said optical image for optical conveyance to said camera imaging system.

55. (New) A system according to claim 54, wherein said lens means is one or more fish-eye lenses.
56. (New) A system according to claim 52, wherein said input means provides for input to said image transform processor means of one or more of: a direction of view; tilting of a viewing angle; rotation of a viewing angle; pan of said viewing angle; focus of said image and magnification of the selected portion of the image.
57. (New) A system according to claim 56, wherein tilting of said viewing angle through at least 180 degrees is provided for.
58. (New) A system according to claim 56, wherein rotation of said viewing angle through 360 degrees is provided for.
59. (New) A system according to any one of claims 56, wherein pan of said viewing angle through at least 180 degrees is provided for.
60. (New) A system according to claim 59, wherein pan of said viewing angle through 360 degrees is provided for.
61. (New) A system according to claim 52, wherein said input means is a user-operated manipulator switch means.
62. (New) A system according to any one of claims 52, wherein said input means is a signal from a computer input means.

63. (New) A system according to claim 52, wherein said image transform processing means is programmed to implement the following two equations:

$$x = \frac{R\{uA-vB+mR\sin\beta\sin\delta\}}{\sqrt{u^2+v^2+m^2R^2}}$$

$$y = \frac{R\{uC-vD+mR\sin\beta\sin\delta\}}{\sqrt{u^2+v^2+m^2R^2}}$$

where:

$$A = (\cos\phi\cos\delta - \sin\phi\sin\delta\cos\beta)$$

$$B = (\sin\phi\cos\delta + \cos\phi\sin\delta\cos\beta)$$

$$C = (\cos\phi\sin\delta + \sin\phi\cos\delta\cos\beta)$$

$$D = (\sin\phi\sin\delta + \cos\phi\cos\delta\cos\beta)$$

and where:

R = radius of the image circle

β = zenith angle

δ = Azimuth angle in image plane

ϕ = Object plane rotation angle

m = Magnification

u,v = object plane coordinates

x,y = image plane coordinates

64. (New) A method for providing perspective corrected views of a selected portion of an optical image captured with a wide angle lens, the received optical image being distorted, the method comprising:

providing a digitised signal corresponding to said optical image;

selecting a portion of said optical image;

transforming said digitised signal to produce an output signal corresponding to a

perspective corrected image of said selected portion of said received image; and
displaying or recording said perspective corrected image of said selected portion;
characterised in that said step of transforming said digitised signal comprises
calculating transform parameters for said selected portion of said image, said calculated
transform parameters being used to control said transformation of the digitised signal to
generate said output signal.

65. (New) A method according to claim 64, comprising first receiving said optical image, producing signals corresponding to said received optical image and digitizing said signals.

66. (New) A method according to claim 64, comprising capturing said optical image with one or more fish-eye lenses.

67. (New) A method according to any one of claims 64, wherein said step of selecting the portion of the image to view comprises selecting one or more of: a direction of view; tilting of a viewing angle; rotation of a viewing angle; pan of said viewing angle; focus of said image and magnification of the selected portion of the image.

68. (New) A method according to claim 67, wherein tilting of said viewing angle through at least 180 degrees is provided for.

69. (New) A method according to claim 67, wherein rotation of said viewing angle through 360 degrees is provided for.

70. (New) A method according to any one of claims 67, wherein pan of said viewing angle through at least 180 degrees is provided for.

71. (New) A method according to claim 70, wherein pan of said viewing angle through 360 degrees is provided for.
72. (New) A method according to any one of claims 64, wherein selection of said portion of the image to view is achieved using a user-operated manipulator switch means.
73. (New) A method according to any one of claims 64, wherein selection of said portion of the image to view is controlled by a signal from a computer input means.
74. (New) A method according to any one of claims 64, wherein said image transformation implements the following two equations:

$$x = \frac{R\{uA-vB+mR\sin\beta\sin\delta\}}{\sqrt{u^2+v^2+m^2R^2}}$$

$$y = \frac{R\{uC-vD+mR\sin\beta\sin\delta\}}{\sqrt{u^2+v^2+m^2R^2}}$$

where:

$$A = (\cos\phi\cos\delta - \sin\phi\sin\delta\cos\beta)$$

$$B = (\sin\phi\cos\delta + \cos\phi\sin\delta\cos\beta)$$

$$C = (\cos\phi\sin\delta + \sin\phi\cos\delta\cos\beta)$$

$$D = (\sin\phi\sin\delta + \cos\phi\cos\delta\cos\beta)$$

and where:

R = radius of the image circle
 β = zenith angle
 δ = Azimuth angle in image plane
 ϕ = Object plane rotation angle
 m = Magnification
 u, v = object plane coordinates
 x, y = image plane coordinates

75. (New) A method according to any one of claims 64, wherein a plurality of portions of said image are selected for viewing and are displayed either simultaneously or consecutively.

76. (New) A method according to any one of claims 64, wherein the image is viewed interactively by repeating the steps of selecting, transforming and displaying said portion of the image.

77. (New) A method according to claim 64, wherein said step of transforming the image is based on lens characteristics of the wide angle lens.

78. (New) A method according to claim 77, wherein the step of transformation is based on azimuth angle invariability and equidistant projection.

79. (New) A method according to claim 64, wherein the step of transforming the image is performed at real time video rates.